

Experimental Program to Rebuild the Moose Population in GMU 19D

Prepared by
[The Adaptive Wildlife Management Team](#)

RECOMMENDATIONS TO
Frank Rue, Commissioner of Fish and Game

February 8, 2001

Introduction	Brief History
Purpose Statement	Findings and Principles
Wildlife Population & Harvest Objectives	Program Concepts
Adaptive Management Program and Timeline	

Introduction

The current moose population in Game Management Unit 19D (east) is not capable of providing the historical harvest level or providing for the needs of many local residents. The moose population is at a low density and thought to be in equilibrium with predators. Most biologists generally agree it will remain at a low-density dynamic equilibrium unless a management action is taken or a natural event occurs that reduces the black bear and wolf population and the attendant levels of predation. The low density of moose is confirmed by 3 moose population estimates (1996-1924 moose, 1999-1400 moose and 2000-850 moose). The moose population estimate obtained in 2000 was done in the fall and is not directly comparable to the spring estimates made in 1996 and 1999. However, all survey estimates are internally consistent and indicate a situation that is also consistent with reports from local hunters that the moose population is extremely low. The moose density of 0.2 per mi² in the spring of 1999 and the density of 0.16 moose per mi² in November 2000 are some of the lowest measured in Alaska. In the 1980s and early 1990s, the moose population in the area was thought to be about 5000 to 8000, but no statistically reliable estimate was made until 1996.

The wolf population has also declined as the availability of moose has declined. The wolf population estimate for the 5200-mi² area designated for wolf control was 165 in midwinter of 1995. The most recent wolf survey in this same area, conducted in 1997, resulted in a population estimate of 56 wolves.

[Top of Document](#)

Brief History

Wolf control has been a controversial issue in Alaska since 1915 when the federal government authorized the first bounty. People's attitudes toward wolf management are based on deeply held values. Conflicts between people with different values have fueled the controversy for decades, and this is not likely to change.

In the early 1940s and 1950s, widespread wolf control occurred through poisoning, bounties and aerial shooting by federal agents. The first aerial hunting began in 1948 and was done mostly by federal agents until the late 1950s when aircraft became more common for private use.

Control efforts were highly effective. Poisoning of predators is largely non-selective and resulted in depressed wolf and bear populations, particularly black bears which predominate over brown bears in this region and are highly opportunistic scavengers susceptible to poison baits. This resulted in artificially high populations of ungulates over much of Interior Alaska, including the upper Kuskokwim River drainage.

One of the first acts of the legislature after Statehood was to prohibit poisoning of predators. However, aerial shooting was a common practice throughout Interior Alaska until passage of the federal Airborne Hunting Act in 1971. Land and shoot hunting quickly took the place of aerial hunting in many areas of Alaska. Land and shoot hunting continued until 1996 when a statute was passed by ballot initiative to prohibit this method of hunting.

The Commissioner of the Alaska Fish and Game Department can authorize land and shoot taking of wolves in limited cases as part of a wolf control program.

In the past, moose populations throughout Interior Alaska generally responded to predator control. Moose populations were high in most areas of Interior Alaska where the habitat was able to support high moose densities. In GMU 19D (east) the moose population was estimated to range from 5000 to 8000 moose during the 1970s and early 1980s. Moose seasons and bag limits were very liberal during this period. Seasons lasted for several months and at times the bag limit was two moose.

Weather conditions of the late 1980s and early 1990s were often not favorable to moose survival and are considered an important element in the decline of the population.

Weather will remain a key factor in rebuilding and maintaining the moose population.

The black bear population began to recover soon after the ban on poison. However, black bears have a low reproductive rate and it took 25 to 30 years for the population to reach high levels. Today, the black bear population in GMU 19D (east) is high, and black bears are believed to be a significant predator on moose calves. Estimates range as high as 50 percent calf mortality from black bears.

Wolves have a much higher reproductive rate than bears and responded rapidly when aerial shooting and later land and shoot hunting was stopped. Wolves became a significant factor in moose survival, and moose season and bag limits were reduced accordingly. Today, the moose population in GMU 19D (east) is at a very low density, and predation by wolves and black bears is keeping the population from growing. The moose season was reduced numerous times during the late 1980s and 1990s. Currently, the hunting season is only 20 days in September with a bag limit of one bull.

Nonresidents are not allowed to hunt moose in this area and nonlocal Alaskans are urged to hunt elsewhere.

McGrath serves as a regional airport hub for the Upper Kuskokwim area. Many hunters use the McGrath airport for access into other areas of Interior Alaska. Some people think the moose harvest by nonresident hunters is high in the McGrath area because they see moose being transported through the McGrath airport. Very few nonlocal hunters hunt in Unit 19D (east); they simply travel through McGrath after hunting in other areas.

[Top of Document](#)

Purpose Statement

The purpose of the team is “to make recommendations to Frank Rue, Commissioner of the Alaska Department of Fish and Game, on wildlife management options to reverse the decline of and rebuild and maintain the moose population of Unit 19D (east) to meet local needs while maintaining healthy populations of other wildlife, including a balance among moose, wolves and bears.”

[Top of Document](#)

Findings and Principles

The team was able to reach agreement on most elements of this management plan. As a basis for the specific recommendations, the team established the following findings. These are intended to serve as principles that guide the program.

1. There is a real problem in this area. The moose population is very low and cannot sustain a harvest sufficient to meet the needs of local residents.
2. Multiple factors are responsible for the decline in the moose population. Severe winters in combination with high levels of predation during the late 1980s and early 1990s caused the population to decline to very low density. In the current situation predation will keep the moose population from growing for a long time.
3. Regulation of predator populations through management actions can be controversial. Members of the work group have a wide variety of values, but predator control is one of the few effective intervention actions available to wildlife managers. Some level of predator control is necessary to achieve the goals of the purpose statement.
4. Management actions aimed at reducing natural predation on moose (predator control) will be undertaken only if the proposed actions have a reasonable probability of success, are carefully monitored, and reductions

in wolf and black bear populations will be not greater and occur not longer than is necessary to achieve a reasonable moose population required to meet the needs of local residents.

5. Hunters will need to make additional sacrifices by agreeing to temporarily reduce their harvest and close a small specific area to hunting. In recent years, human harvest has been substantially restricted through regulatory actions. While harvest levels are now low, continued human harvest in key areas could reduce or delay moose recovery.
6. People who do not hunt and place a high value on natural wildlife populations will need to accept management actions they do not like.
7. The Alaska Department of Fish and Game will have supervisory authority and control of all management actions.
8. This is an adaptive management experiment that is science-based. It is not a strictly controlled scientific experiment. However, it will include a strong, ongoing research and science component. This will provide wildlife managers with valid scientific information that will improve their ability to regulate predator populations and keep them in balance with their prey populations in Unit 19D (east) and other areas of Alaska.
9. This is a short-term program of intervention designed to stimulate the rebound and rebuilding of the moose population by curtailing harvest by both humans and predators in key areas. However, neither closure to human harvest nor predator control is intended to be long-term. This report proposes reasonable long-term population objectives for moose and predators. Over the long-term these populations will be managed through informed, standard wildlife management practices that should require neither hunting closures nor predator control.
10. The adaptive management program will be evaluated periodically by the adaptive management team and methodologies may be modified, but the principles on which this plan are based will not be altered.

[Top of Document](#)

Wildlife Population And Harvest Objectives

Moose

The moose population objective for Unit 19D (east) is 3000 to 3500, approximately 0.4 moose per mile². This population objective is significantly below the objective of 6000 to 8000 moose set by the Board of Game. However, it is a population level that will provide

the number of moose necessary to meet the needs of the local people and a population level that can be sustained without continual wolf and black bear control.

The annual moose harvest objective is 130 to 150 moose. This is the number necessary to meet the subsistence needs of residents of Unit 19D (east). This harvest level was determined using two independent methods that produced similar numbers. The Division of Subsistence has studied the number of moose consumed per capita in numerous villages in Alaska. The general rule of thumb is that 0.2 moose per person per year meets the subsistence needs. The team used the 0.2 number for McGrath but increased this to 0.5 for Nikolai, Takotna and Telida residents because they are more dependent on moose. This resulted in an estimated need for an annual harvest of 140 moose. The team also evaluated the reported and estimated historical harvest data from this area and found that 130 to 150 moose were necessary to meet the needs of local residents.

This harvest level is about 4 percent of the population objective of 3000 moose. This harvest level can be sustained without predator control, and the goal of the team is to cease predator control once the moose population reaches 3000. Wolf hunting and trapping and black bear hunting will be used to regulate the predator populations beyond the recovery period.

Reported moose harvest by hunters is about 50 moose per year and another 40-50 are probably legally taken but not reported. In most areas of Unit 19D, hunting is considered to have a minimal impact on the moose population, but harvest by humans can affect recovery of the population.

Wolves

The long-term wolf population goal for this area is 60 to 80 wolves. The long-term wolf population goal is to manage wolves at a moose:wolf ratio of 30:1 for population stability. During the rebuilding process, wolves may be reduced to 50:1 or lower.

During the moose population recovery process, the wolf population within Unit 19D (east) will not be allowed to drop below 20 wolves prior to pupping. This count will include only the wolf packs whose home range occupies a significant portion of Unit 19D (east). Wolf packs that infrequently travel into a small portion of Unit 19D (east), such as the Western Denali Park pack, will not be included. A wolf population estimate will be made each winter and the wolf hunting and trapping season will be closed by emergency order if necessary to maintain a population of at least 20 wolves in the area.

Black bears

The goal for black bears is to increase the harvest rate, reduce the density of black bears and lower their predation rate on moose calves.

The department does not have an estimate of the black bear population in this area. It is very difficult, and a long process, to develop a black bear population estimate in the type of vegetation in the McGrath area. By extrapolating bear densities measured in similar vegetation types, we can make a rough population estimate. However, it is not necessary to have a precise black bear population estimate to know if management actions to reduce bears are effective in reducing predation on moose calves.

[Top of Document](#)

Program Concepts

Key elements of the adaptive management program are listed:

1. An experimental Micromanagement Area (MMA) will be established along the river corridors near McGrath. The MMA will be about 750 mi² in size and is expected to include about 50% of the moose population in Unit 19 D (east). This is also the area where many local residents hunt moose and the area where it is most feasible for residents to hunt black bears. The MMA boundary will likely shift based on information collected from radiocollared moose. The objective is to locate the MMA in areas that have the most concentrated moose calving, the highest densities of moose, and the best moose habitat.

The approximate boundary of the MMA will encompass, roughly a 10-mile river corridor around McGrath. Extending from Vinasale Mountain upstream to the mouth of Big River on the Kuskokwim, and on the Takotna River downstream from the confluence of the Nixon Fork River to the confluence with the Kuskokwim at McGrath. This area is approximately 750 mi².

2. Management of the moose harvest
 - a. The MMA will be closed to all moose hunting for 2-3 years and then reopened on a limited basis.
 - b. The remainder of GMU 19D (east) will be managed by a registration hunt. Permits will be issued in McGrath, Telida and Nikolai and must be obtained 5 days before the opening of the season. Hunters will be required to report their harvest to the ADF&G office in McGrath within 5 days of taking a moose. The moose season will be closely monitored and closed by emergency order if it appears that overharvest might occur.
3. Control of predation by wolves
 - a. Wolf predation will be reduced in a phased approach and no more intensive action will be taken than is necessary.
 - b. The first phase will be trapping by local residents. The department will provide trappers with information on wolf kill sites. If trappers are not able to harvest the number of wolves necessary to achieve the harvest goal, the department will contract with 2 to 3 local pilots to conduct land and shoot taking within the wolf control area (phase 2). These local pilots will be selected based on their ability and knowledge of the local geography. They will check in with the ADF&G office in McGrath each morning and evening they hunt and will carry a GPS device to record their travel routes and the location of each wolf kill site. Land and shoot taking will begin in late February, 2001 if trappers have not harvested enough wolves.

- c. Phase 3 would occur in the winter of 2001-2002. If land and shoot hunters are not successful in harvesting enough wolves during the previous winter, shooting by department employees from helicopters will be conducted.
- d. Land and shoot taking in 2001, and in subsequent years if authorized, will be focused on the central to western portions of GMU 19D (east).
- e. The northeastern boundary of Unit 19D (east) is near the western boundary on Denali National Park. One or two packs of wolves that live primarily within the National Park occasionally move into the far eastern portion of Unit 19D (east). Wolf control efforts will not occur in the area used by these wolf packs.

See [dissenting opinion](#) by Leo Keeler on using the method of land and shoot taking of wolves to control the wolf population.

4. Control of Predation by black bears.

- a. A moose calf mortality study will be conducted in May and June 2001. If black bears are not a significant cause of moose calf mortality (at least 25% of the calf crop), bear population reduction will not occur. If it is determined that black bears take over 25 percent of the moose calf crop, a phased bear reduction program will occur but ONLY within the MMA.
- b. The first phase, conducted in the summer of 2001, will be to encourage local hunters to harvest more bears. The department will conduct a bear baiting clinic in McGrath and Nikolai to inform people of bear baiting regulations and accepted practices and encourage them to harvest black bears.
- c. Phase 2 of black bear population reduction, if necessary, would begin in the summer of 2002. The department would assist local hunters with a bear-baiting program or a department-sponsored bear trapping program will be initiated.
- d. If phase two of the bear reduction plan is implemented, the adaptive management team would devise protocols to deal with all aspects of the program such as timing, care of the meat, and other issues.

5. Research and Science Program

- a. This is an experimental adaptive management program. ADF&G will collect data to evaluate the moose, wolf, and black bear populations to determine if management actions are effective in reducing predation rates on moose without long-term harm to the predator population.

- b. data collection to evaluate the program will occur concurrently with actions to reduce predation by wolves. Some people argue that it would be preferable to collect more data on wolf predation rates before initiating wolf reduction, but the team decided it was important to begin the program this winter. Department scientists will still be able to determine moose mortality rates from all causes, including the predation rate of wolves and black bears on moose.
- c. In a rigorously controlled scientific experiment to evaluate effects of wolf control and bear reductions on moose calves, calf survival would be measured in several replicate treatment and control areas. However, this is not feasible in this adaptive management program. Department scientists will be able to ascertain if wolf control or bear reduction is effective in decreasing moose mortality by measuring cow:calf ratios in the fall and the percentage of calves in the population in spring.
- d. The department will continue to monitor experimental methods of predator management, including new contraception drugs and delivery systems that are being evaluated by other agencies. If these methods have a potential benefit to this situation, they will be field-tested in Alaska.

[Top of Document](#)

The Adaptive Management Program and Timeline

Wolf predation reduction throughout Unit 19D (east)

December 2000 through February 15, 2001. Local trappers will be urged to trap wolves. Information on wolf movements and locations of kill sites observed during flights will be provided to local trappers to increase their efficiency.

The ADF&G will purchase carcasses of wolves trapped in Unit 19D (east) for research purposes. Trappers will be paid \$45 if they turn in the skinned carcass to DWC personnel. The department buys wolf carcasses from trappers in most of our wolf research programs. We can gain much information from the carcasses, such as food habits, body condition, age structure of the population, and reproductive history. It is often a big effort for trappers to bring the carcasses in from the field. To encourage them to do so we pay them a standard fee of \$45. The payment is \$45 because that is the dollar amount that a trapper receives for selling a raw wolf skull. We do not consider this a bounty but simply an incentive for trappers to bring the wolf carcasses in from the field. January/February 2001. DWC staff will obtain a wolf population estimate for Unit 19D (east) and determine the number of wolf packs in the area and their approximate distribution.

February 15, 2001. The DWC will evaluate harvest levels and determine if trappers are likely to meet the wolf harvest goal by the end of the trapping season. If the harvest goal appears to be achievable, no further action will be authorized. If by late February it appears that trapping will not achieve the harvest goal, the department will contract with 2 to 3 local pilots. These pilots will be authorized to take wolves by land and shoot practices in areas of Unit 19D (east) specified by the DWC beginning about March 1. The pilots will be carefully chosen for their knowledge of the local area and ability to harvest wolves. These pilots will be required to check in each morning and evening on days they hunt wolves. Each pilot will carry a GPS device that will record the travel route and precise location of each wolf killed. The department will conduct periodic checks to insure that pilots are following all rules and accurately reporting locations of wolf kills. All wolf carcasses will be retrieved and used for research.

The program will be reevaluated in the fall of 2001. If local trapping efforts and land and shoot actions have failed to achieve the wolf harvest goal, a third step will be added. Department-conducted wolf shooting from helicopters will be implemented in early winter, but not before a wolf census is conducted, if this option is exercised. Reducing wolf numbers in the fall will allow the moose population to recover faster by increasing overwinter survival. Additional helicopter shooting may be conducted in late winter in the MMA and in the territories of wolf packs that occupy a portion of the MMA to achieve wolf population reduction goals.

The wolf population within Unit 19D (east) will not be reduced below 20 wolves in spring prior to pupping. If this minimum population level is approached, trapping will be closed by emergency order.

Black bear predation reduction in the MMA

June 2001. Black bear population reductions will be focused within the MMA. In phase 1 of the program, hunters will be encouraged to bait and shoot black bears during the spring and fall baiting seasons. The department will identify areas within the MMA where baiting would likely be most successful and encourage hunters to use these areas. The proposed MMA is believed to contain about 150 black bears; efforts will be made to take most, if not all, black bears in the area, except sows with cubs.

Summer 2002. If black bear hunters do not harvest an adequate number of bears from the MMA, phase 2 will be implemented. The department will provide direct assistance to people who operate bait stations or we will hire local residents to trap black bears for a 4-6-week period in May, June, and July. If phase 2 is implemented, the adaptive management team will establish protocols for all aspects of this effort.

Two proposals related to black bear harvest will be submitted to the Board of Game for their consideration at the March 2001 meeting. A proposal to require in-unit sealing of black bears harvested in Unit 19 will be submitted to the Board of Game for their consideration at their March 2001 meeting. This will allow the department to closely monitor black bear harvest.

Another proposal will be submitted to the Board of Game to extend the existing bear baiting season to include September 1-30.

Program to reduce moose harvest until population is rebuilt

The Board of Game has taken several actions in the past 5 years to reduce moose harvest in the area. All nonresident moose hunting is prohibited in Unit 19D. The season length

has been reduced to 20 days in September and 15 days in December. The December season in 2000 was closed by emergency order due to the low moose population. Nonlocal hunters will be discouraged, by all means possible, from hunting in Unit 19 D (east).

Three proposals related to moose harvest will be made to the Board of Game for consideration at their March, 2001 meeting:

1. Proposal to change the moose population and harvest goals for moose in Unit 19D (east) to the goals established by the work group.
2. Proposal to establish a registration hunt in Unit 19D (east). This will allow the department to closely monitor moose harvest and close the season if the harvest is excessive.
3. Proposal to extend the Upper Kuskokwim Controlled Use area to include all of Unit 19D (east). This will insure that aircraft are not used to hunt moose with the predator control area.

Maintenance of the moose and predator populations after recovery

It will take several years for the moose population to recover to the goals established by the work group. When the moose population reaches 3000, department-sponsored predator control will cease. Wolf trapping and hunting and bear hunting will be encouraged to help maintain the moose population at 3000-3500 moose.

The wolf population will grow to 60-80 wolves. The wolf population will be monitored to see if trapping and hunting can regulate the wolf population at this level.

Department sponsored baiting or trapping of black bears will cease when the moose population reaches 3000. Local hunters will be encouraged to continue to hunt bears.

Research and Evaluation of Program

This is an experimental program. Results cannot be guaranteed. As with all experiments, information gained should continue to influence further actions. The adaptive management team will continue to exist after the plan is implemented. They will meet at least once per year and more often if necessary. They will review results of all research efforts and make modifications to techniques employed or timing of actions. It should be expected that modification will be made as new knowledge is gained. However, the intent of the goals and objectives outlined in this plan will not be altered.

Specific actions that will occur include:

February/March 2001. Approximately 25 adult cow moose and 15 yearling female moose will be radiocollared so their movement patterns and reproductive success can be evaluated. Systematic aerial surveys will be flown to determine the home range and movement patterns of each radio-collared moose. Mortality rates and reproductive success of the radio-collared moose will be determined by systematic aerial surveys at appropriate times. These radio collars last about 5 years so mortality can be monitored for a significant period. Moose that survive for 5 years will be recollared to continue our collection of mortality data.

Summer, 2001. A moose calf mortality study will be conducted to determine causes of moose calf mortality. Fifty newborn moose calves will be equipped with radio collars that inform biologists when a calf dies. Each kill site will be examined to determine the cause

of death. These radio collars expand as the moose grows and last approximately 18 months, allowing the monitoring of mortality for the first 1.5 years of life.

March, 2002. An additional 15 female yearling moose will be radiocollared.

Each spring and fall. Calf survival to fall and overwinter survival will be monitored annually by aerial surveys in long-established trend count areas.

Each winter. An estimate of the wolf population will be made each winter so that a harvest goal can be established and monitored to ensure the wolf population is not reduced below the minimum population size of 20 wolves.

Winter of 2002/2003. A moose population estimate in Unit 19D (east) will be made in the spring of 2002 and at 3-year intervals thereafter. Annual counts on calf:cow ratios will be made. This metric will be the key indicator of success and is more sensitive than population estimates.

The DWC has a research project underway in Southcentral Alaska to test the feasibility of using genetic markers to produce a population estimate for black bears. If this technique appears to be successful, it will be applied to GMU 19D (east) as soon as possible.

As moose density increases in the MMA, the browse will be subjected to a higher level of use. Browse condition in the MMA will be monitored and mechanical rehabilitation of riparian willow stands will be conducted as necessary.

A detailed study plan that thoroughly explains the project will be developed by July 2001. It will include a detailed description of the following methods and mapping:

1. Methods used to collect data
2. Methods used to analyze data
3. A precise boundary and a map of the MMA.

The division, in conjunction with the adaptive management team, will establish benchmarks that need to be achieved for the program to succeed. If significant progress is not made toward recovery in a timely manner, the management actions will be altered or the program terminated. The most important benchmark will be fall calf/cow ratios and winter percentages of calves in the moose population. Within the MMA we expect to achieve a fall cow/calf ratio of 50 calves per 100 cows by 2004. We expect an overwinter survival rate of calves of 90 percent by 2003. The department and the Adaptive management team will evaluate these figures each year and make a judgement call if adequate progress is being made for the program to continue.

The efficacy of the first phase of this plan being primarily limited to public-only efforts is questionable. However, the utility of the first phase will be to demonstrate to the public that it is nothing more than status quo. The second phase actions are more aggressive and have a higher probability of effectiveness to reduce predation, but the results could be well below what is required to attain the population growth needed to restore this population. The third phase actions are the most aggressive proposed and have the highest probability of removing enough predators to achieve the population growth rate required to restore this moose population in a timely manner.

Land And Shoot Dissenting Opinion
by Leo Keeler

I do not agree that land and shoot by locals should be included in the experimental management plan. I personally cannot accept it as a proper activity for taking wolves, and I believe the public's distaste for it will cause actions to be taken against the entire plan. If there is not time to obtain the scientific data to support various actions as requested by several scientists, then control efforts should be implemented as rapidly as possible by the Department.

Allowing land and shoot greatly increases the potential for wounded animals wandering around for days and the opportunity for the media to portray the activity as extremely inhumane. This, combined with the general public rejecting land and shoot in the last election and their strong doubts about the McGrath problem being sufficient enough to warrant predator control, requires that the Department show extreme control and sensitivity in all phases of the plan. The Department must place a high enough priority on resolving McGrath's problem to use agency funds for all activities.